

CLAIMS

1. A fuel tank having a valve assembly for reduced fuel permeation, the fuel tank comprising:

a tank shell having an outer layer and an outer lip extending outwardly from the outer layer, the outer lip defining an aperture formed through the tank shell and having inner and outer sides, the tank shell including a fuel delivery module cover disposed thereon, the tank shell comprising a predetermined material;

a venting valve for venting a gaseous hydrocarbon fluid at a predetermined pressure from the tank, the valve being disposed through the aperture to define a circumferential space between the inner side of the outer lip and the venting valve;

a channel having first and second ends, the first end connecting to the venting valve within the tank so that the venting valve is in fluid communication therewith when the valve vents fluid, the second end being attached to the fuel delivery module cover to allow fluid in the tank to be vented therefrom;

a retention member disposed about the venting valve and attached to the outer layer about the outer side of the outer lip defining an expansion boundary so that the outer lip only expands toward the venting valve to seal the circumferential space when the tank absorbs hydrocarbons; and

a cover comprising the predetermined material and attached to the outer layer to seal the valve between the cover and the outer layer.

2. The fuel tank of Claim 1 wherein the tank shell has an inner layer, the inner and outer layers cooperating to form the outer lip.

3. The fuel tank of Claim 1 wherein the venting valve includes a valve body having a top portion and a neck portion integrally extending from the top portion to define the circumferential space.

4. The fuel tank of Claim 3 wherein the neck portion has a port extending from the neck portion.

5. The fuel tank of Claim 4 wherein the top portion engages the retention member to suspend the venting valve in the tank.

6. The fuel tank of Claim 1 further comprising a permeation barrier material welded between the cover and the outer layer of the tank shell.

7. The fuel tank of Claim 6 wherein the outer layer and the cover have substantially the same coefficients of expansion.

8. The fuel tank of Claim 6 wherein the permeation barrier material is nylon.

9. The fuel tank of Claim 5 wherein the aperture is defined by a first portion, the neck portion of the valve body engaging the tank shell in the first portion.

10. The tank of Claim 9 wherein the first portion is a circular portion, the neck portion being configured to have dimensions complementing the circle portion.

11. The tank of Claim 4 wherein the port is a male nozzle and the channel is a tube having a female end disposed about the port.

12. The tank of Claim 4 wherein the port is a quick connect end and the channel is a corresponding quick connect end attaching to the port.

13. The tank of Claim 2 wherein the inner and outer layers of tank shell are made of a high density thermoplastic.

14. The tank of Claim 2 wherein the tank shell further includes a middle barrier layer disposed between the inner and outer layers.

15. A venting assembly for venting a gaseous fluid from a fuel tank having an outer layer and a fuel delivery module cover, the venting assembly comprising:

an outer lip of the fuel tank extending outwardly from the outer layer, the outer lip defining an aperture formed through the tank shell and having inner and outer sides;

a venting valve for venting a gaseous hydrocarbon fluid at a predetermined pressure from the tank, the valve being disposed through the aperture to define a circumferential space between the inner side of the outer lip and the venting valve;

a cover attached to the outer layer to seal the valve between the cover and the outer layer; and

a retention member disposed about the venting valve and attached to the outer layer about the outer side of the outer lip defining an expansion boundary so that the outer lip only expands toward the venting valve to seal the circumferential space when the tank absorbs hydrocarbons.

16. The assembly of Claim 15 wherein the venting valve includes a valve body having a top portion and a neck portion integrally extending from the top portion to define the circumferential space.

17. The assembly of Claim 16 wherein the neck portion has a port extending from the neck portion.

18. The assembly of Claim 17 wherein the top portion engages the retention member to suspend the venting valve in the tank.

19. The assembly of Claim 15 further comprising a permeation barrier material welded between the cover and the tank.

20. The assembly of Claim 19 wherein the permeation barrier material is nylon.

21. The assembly of Claim 18 wherein the aperture is defined by a first portion, the neck portion of the valve body engaging the tank in the first portion.

22. The assembly of Claim 21 wherein the first portion is a circular portion, the neck portion being configured to have dimensions complementing the circular portion.

23. The assembly of Claim 17 wherein the port is a male nozzle and the channel is a tube having a female end disposed about the port.

24. The assembly of Claim 17 wherein the port is a quick connect end and the channel is a corresponding quick connect end attaching to the port.

25. The assembly of Claim 15 wherein the tank is made of a high density thermoplastic.

26. The assembly of Claim 15 wherein the tank includes a middle barrier layer disposed between inner and outer layers.